इंटरनेट मानक

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Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

# IS 625 (2006): Bicycle--Handle Bars--Specification (Third Revision). ICS 43.150

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
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भारतीय मानक

# साइकिल — हैंडल बार — विशिष्टि

( तीसरा पुनरीक्षण )

*Indian Standard*

# BICYCLE — HANDLE BARS — SPECIFICATION

*( Third Revision )*

ICS 43.150

© BIS 2006

**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*February* 2006 **Price Group 7**

Bicycles Sectional Committee, TED 16

## FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bicycles Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was originally published in 1955 and subsequently revised in 1963 and 1993. As a result of experience gained in the manufacture of bicycles, all dimensions and quantities were given in the first revision. Subsequently, in the second revision modifications in the nickel and chromium plating requirements and arrangements for load test on handle bar were done.

This revision is being taken up to align the Standard with International Standard. In the preparation of this standard, assistance has been drawn from the following:

| | |
|---|---|
| ISO 4210 : 1996 | 'Cycles — Safety requirements for bicycles' published by the International Organization for Standardization |
| ISO 6699 : 1990 | 'Cycles — Stem and handle bar bend — Assembly dimensions' published by the International Organization for Standardization |
| ISO 8098 : 2002 | 'Safety requirements for bicycles for young children', published by the International Organization for Standardization |
| JIS D 9412 : 1997 | 'Handle bars for bicycles', published by the Japanese Industrial Standards Committee |

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# BICYCLE — HANDLE BARS — SPECIFICATION

*( Third Revision )*

## 1 SCOPE

This standard prescribes the requirements for handle bars used for bicycles.

## 2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this standards. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| *IS No.* | *Title* |
|---|---|
| 210 : 1993 | Grey iron castings — Specification (*fourth revision*) |
| 1068 : 1993 | Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium (*third revision*) |
| 2039 (Parts 1 to 3) : 1991 | Steel tubes for bicycle and cycle rickshaws — Specification (*second revision*), Parts 1 to 3 |
| 2062 : 1999 | Steel for general structural purposes — Specification (*fifth revision*) |
| 2500 (Part 1) : 2000/ ISO 2859-1 : 1999 | Sampling procedures for inspection by attributes: Part 1 Sampling Schemes Indexed by Acceptable Quality Limit (AQL) for Lot-by-Lot Inspection (*third revision*) |
| IS/ISO 9001 : 2000 | Quality management systems — Requirements |

## 3 MATERIAL

**3.1 Tubes** — The tubes for bicycle handle bars shall conform to IS 2039 (Parts 1 to 3).

**3.2** The material used in the manufacture of other components of handle bars shall comply with requirements specified below:

| *Component* | *Requirement* |
|---|---|
| a) Handle bar lug; lever; down rod; handle bar lever washer; handle bar lever tabs; eye bolt; expander bolt; washer for expander bolt and D-nuts, concave washer and stud for lever lug | Steel; having tensile strength and with standing bend test as specified in IS 2062 |
| b) Lever spring | Spring steel having tensile strength 1 550 Mpa (158 kgf/mm$^2$), *Min* |
| c) Expander cone | i) Steel having tensile strength 42 kgf/mm$^2$, *Min*, or<br>ii) Cast iron of Grade FG 150 of IS 210 |

NOTE — In addition to the minimum physical properties specified, the material for the components shall have other metallurgical properties which would make them suitable for fabrication of that particular component.

## 4 CONSTITUTION AND CLASSIFICATION

Handle bar assemblies shall be constituted with handlebars (hereafter referred to as 'bar') and handle bar stems (including those combined into integral type, hereafter referred to as 'stem'), and classified by use and formation as given in Table 1 and Fig. 1.

## 5 DIMENSIONS

Handles shall comply with the dimensions given as below:

a) Handle bar outer diameter = $22.22^{+0.03}_{-0.13}$ mm.

b) Handle stem outer diameter (coated/plated) = $22.22^{+0.03}_{-0.13}$ mm.

c) The overall width of the handle bar shall be between 350 mm and 700 mm for bicycles for

## Table 1 Classification

(*Clause* 4)

| **Classification** | | | **Shape of Bar (Information Reference)** |
|---|---|---|---|
| Use of Handle bar Assembly | | Assembling Formation | |
| Young children use | Used for bicycles for young children | a) Separate type<br>b) Integral type<br>c) Brake lever combined type | a) Drop type<br>b) Flat type<br>c) Upright type<br>d) High-rise type[1]<br>e) Swaged type<br>f) Others |
| General | Used for bicycles for general use other than MTB — look bicycles | | |

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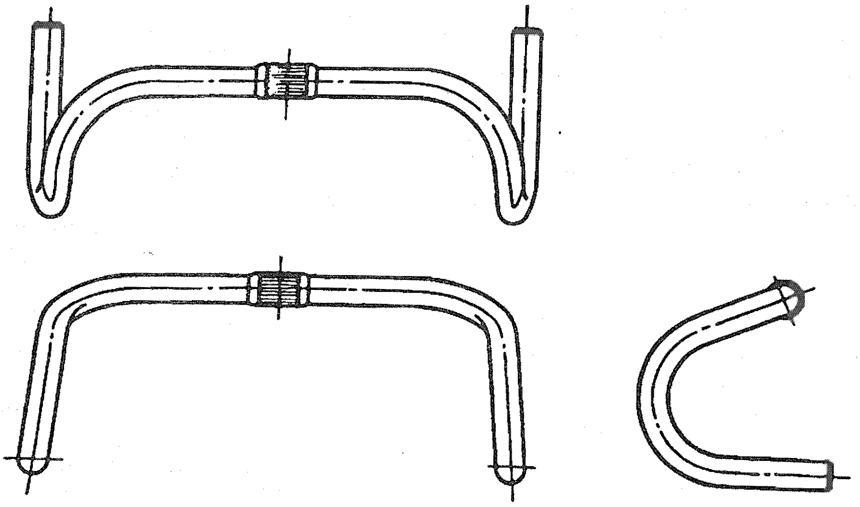
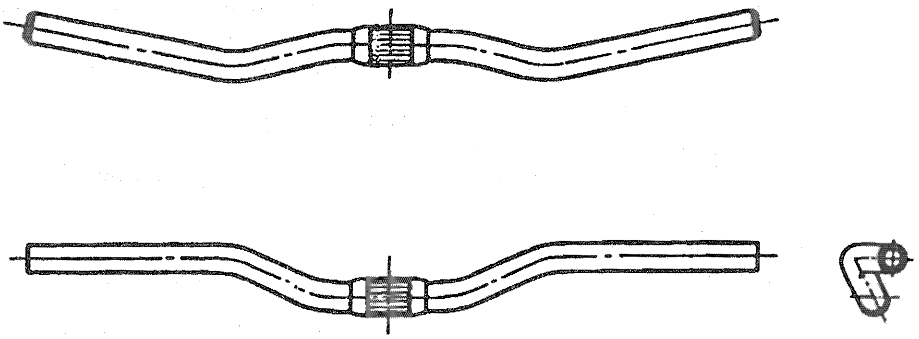
[1] Length of rising portion is longer than 250 mm.

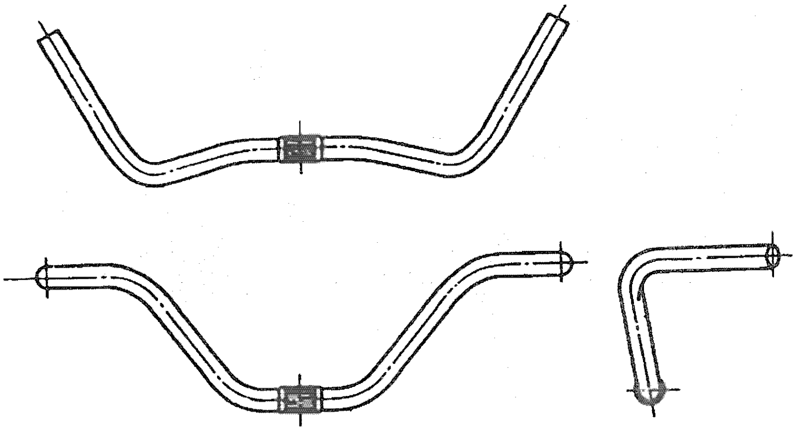


1A Drop Handle Bars

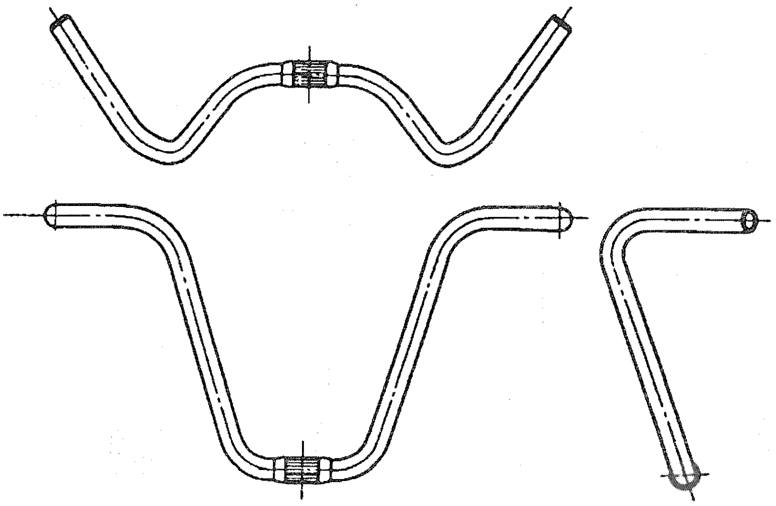


1B Flat Handle Bars

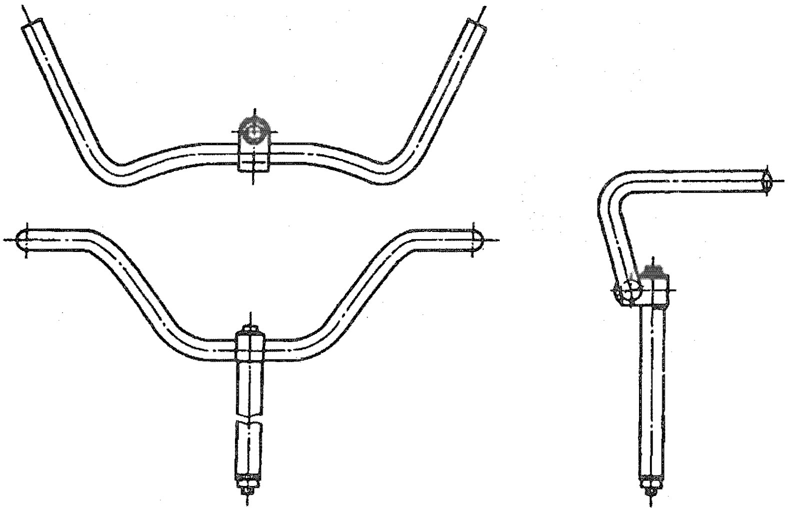
FIG. 1 HANDLE BARS (*Continued*)



1C Upright Handle Bars

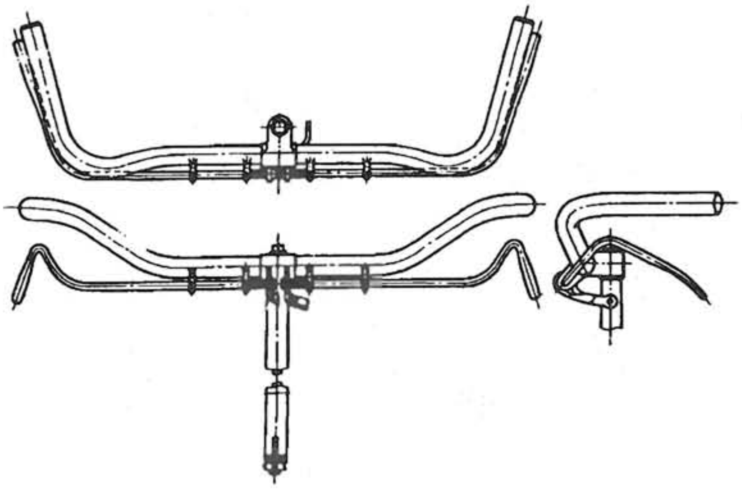


1D High-Rise Handle Bars

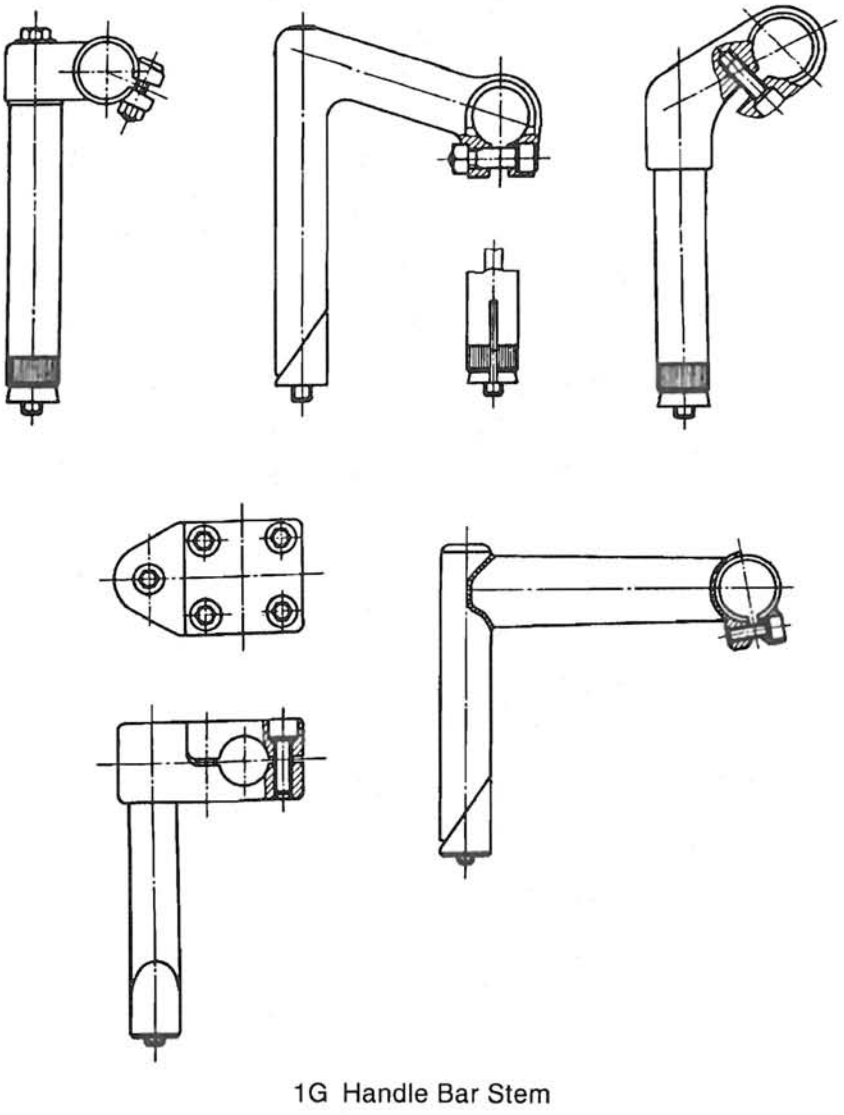


1E Handle Bar Assembly for Young Children (Integral Type)

FIG. 1 HANDLE BARS (*Continued*)



1F Brake Lever Combined Handle Bar Assembly



1G Handle Bar Stem

FIG. 1 HANDLE BARS

general use and between 300 mm and 550 mm for young children use. The vertical distance between the top of the handle bar grips, when assembled to the highest riding position according to the manufacturer's instructions and the seat surface of the saddle in its lowest position shall not exceed 400 mm for bicycles for young children use.

The ends of the handle bars shall be fitted with handgrips or end plugs that will withstand a removal force of 70 N.

d) The handle bar stem shall contain a permanent mark that clearly indicates the minimum insertion depth of the handle bar stem into the fork stem or alternatively a positive and permanent means of ensuring the minimum insertion depth shall be provided. The insertion mark or insertion depth shall be not less than 2.5 times the shaft diameter from the lower end of the stem and there shall be at least one shaft diameter's length of contiguous circumferential shaft material below the mark. An insertion mark shall not affect the strength of the handle bar stem.

e) Expander bolt thread = 7.94 × 0.98 Bicycle thread or M8 × 1 [M8 × 1.25 (optional)].

f) Expander bolt nut thread = 7.94 × 0.98 Bicycle thread or M8 × 1 [M8 × 1.25 (optional)].

g) Thread forms of expander bolt and expander bolt nut is as illustrated in Fig. 2.

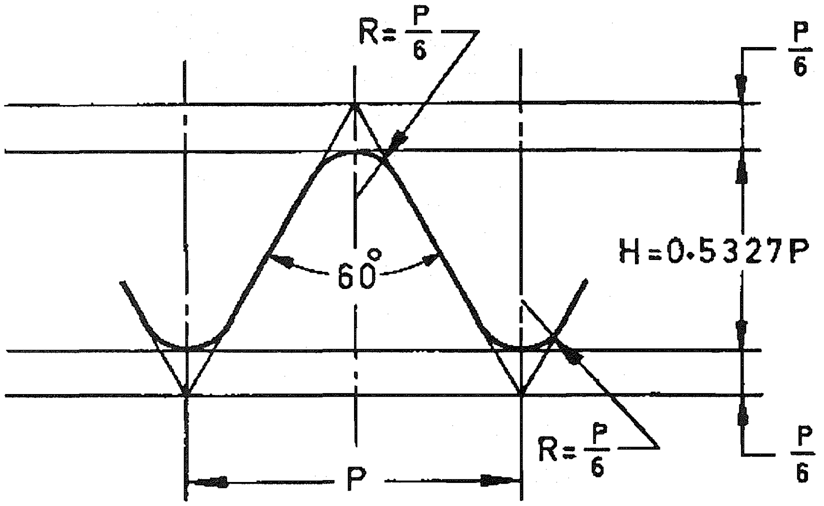
h) The diameter distortion at bends of the handle bar shall be not more than 2 mm.

j) When one side of the hand grip linear parts of bar is closely attached to the plane surface plate, the raised height of the other side shall not be more than 3 mm.

k) Inclination of Brazed Handles, expressed as (*b*/*a*) shown in Fig. 3, of the handle stem to the handle bar bend shall not be more than 1/50.

Inclination of all other handles shall be such that the difference between the heights at handle bar at its both ends '*P*' and '*Q*' as shown in Fig. 4 shall not be more than 10 mm.

m) For the brake lever combined handle bars, clearance between the pivot block hole and the brake lever shall be not more than 0.5 mm.



All dimensions in millimetres.

| *Size* | *Pitch* | *Bolt* | | | | | | *Nut* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Major Diameter | | Effective Diameter | | Minor Diameter | | Major Diameter | Effective Diameter | | Minor Diameter | |
| | | *Max* | *Min* | *Max* | *Min* | *Max* | *Min* | *Min* | *Max* | *Min* | *Max* | *Min* |
| 7.94 × 0.98 | 0.977 | 7.938 | 7.798 | 7.417 | 7.325 | 6.896 | 6.706 | 7.938 | 7.508 | 7.417 | 7.193 | 6.896 |

NOTE — Details of M8 × 1 will be as per relevant specification.

FIG. 2 FORM OF THREADS

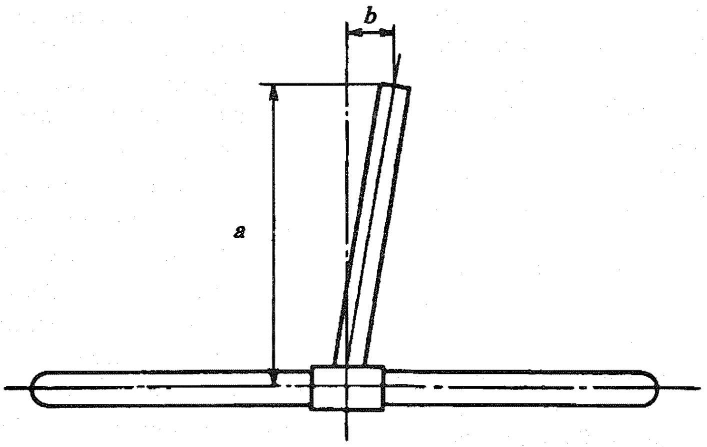


FIG. 3 LEANING OF STEM TO BAR

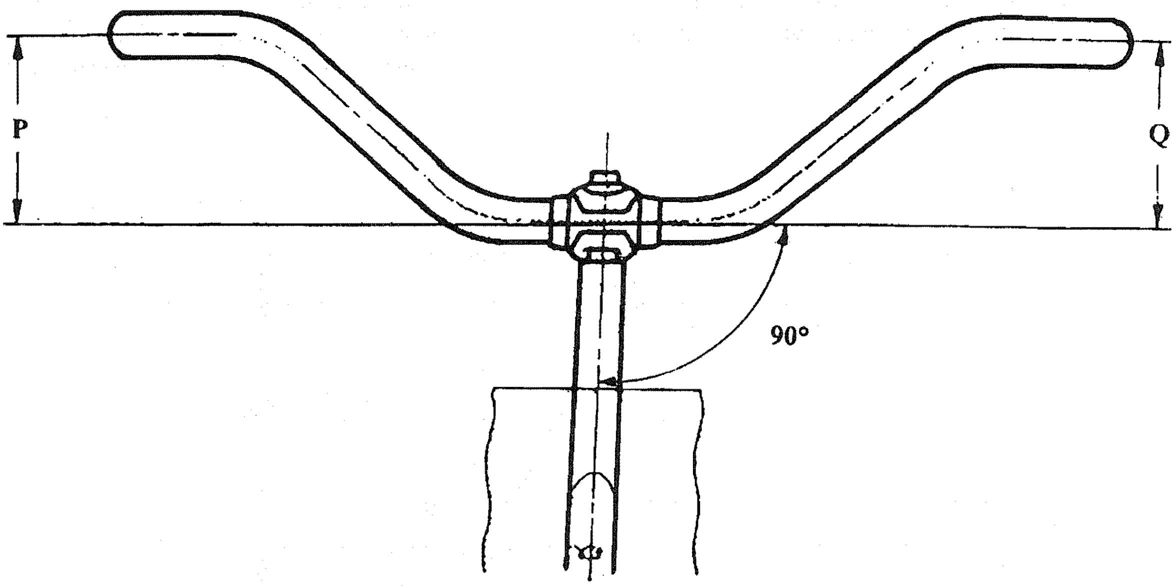

Handle bar as per Fig. 1A or
1B or 1C or 1D or 1E
(Assembled in actual riding position)

FIG. 4 HANDLE BAR INCLINATION FOR NON-BRAZED HANDLES

## 6 STRENGTH

### 6.1 Torque Test, Handle Bar Stem

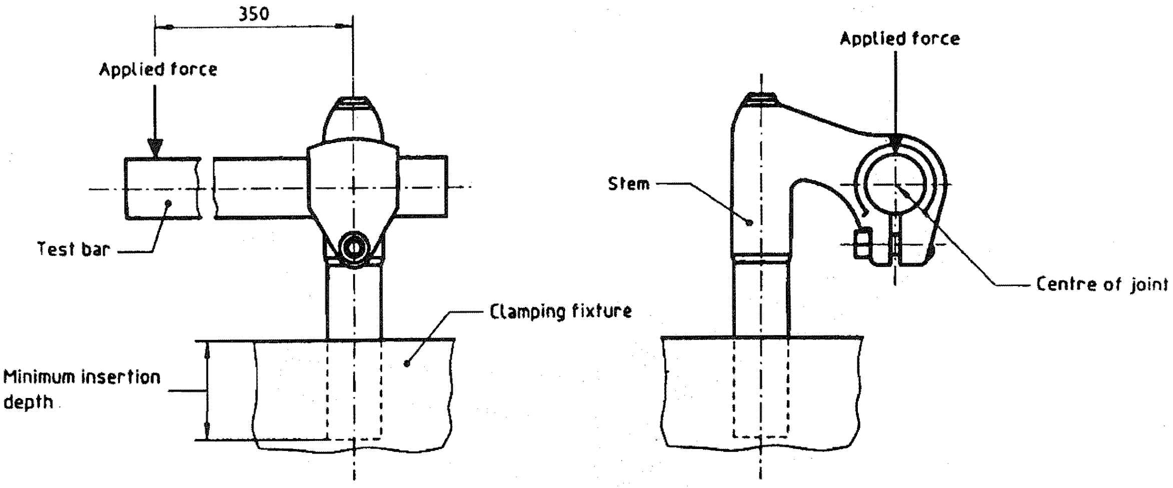
With the handle bar stem securely clamped in a fixture to the minimum insertion depth (*see* 5), and a test bar or handle bar assembled securely to the stem, a torque of 108 N.m (1 100 kgf. cm) for general use or 30 Nm (310 kgf. cm) for young children use shall be applied to the stem by means of the test bar in a plane parallel to the stem and in the direction shown in Fig. 5.

There shall be no visible fracture or deformation.

### 6.2 Handle Bar Stem Bending Test

With the handle bar stem securely clamped in a fixture to the minimum insertion depth (*see* **5**) a static load of 2 000 N (200 kgf) for general use or 500 N (50 kgf) for young children use, shall be applied through the handle bar attachment point in a forward direction and at 45° to the axis of the stem shank as shown in Fig. 6. The handle bar stem shall be capable of withstanding this test without fracture.

If the stem of general use yields, it shall be capable of being bent through an angle up to 45° from the stem



All dimensions in millimetres.

FIG. 5 TORQUE TEST ON HANDLE BAR STEM

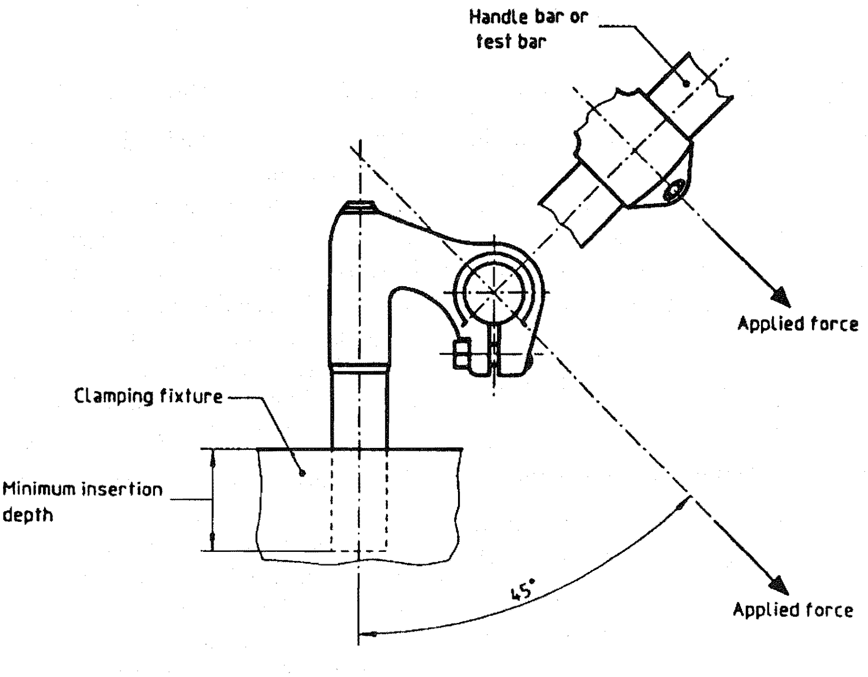


FIG. 6 HANDLE BAR STEM BENDING TEST

axis without fracture and shall support a force of not less than 1 600 N (160 kgf).

### 6.3 Torque Test, Handle Bar and Stem

With the stem of the handle bar assembly securely clamped to the minimum insertion depth in a fixture, a force of 220 N (22 kgf) for general use and 130 N (13 kgf) for young children use shall be applied simultaneously to each side of the handle bar in a direction and at the location that will provide a maximum turning moment at the junction of the handle bar and stem. Where this location occurs at the end of the handle bar, the force shall be applied as near to the end as is practicable, and in any case not further than 15 mm from the end (*see* Fig. 7).

Where the handle bar/stem assembly is secured by means of a clamp, the torque applied to the fastener shall be suitable and shall exceed 20 Nm (200 kgf.cm).

After the test, there shall be no movement of the handle bar relative to the stem.

NOTE — According to the shape of the handle bar, the applied loads might be in a different direction from that illustrated in Fig. 7.

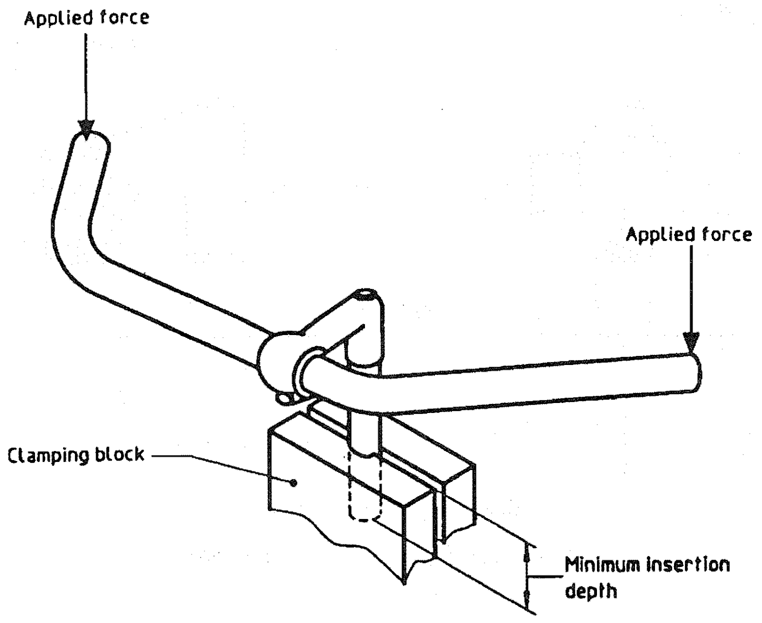


FIG. 7 TORQUE TEST ON HANDLE BAR STEM ASSEMBLY

### 6.4 Torque Test, Handle Bar Stem and Fork Stem

With the handle bar stem correctly assembled in the frame and fork stem and the expander bolt tightened in accordance with the manufacturer's instructions, a torque of 25 N.m (250 kgf. cm) for general use or 15 N.m (150 kgf. cm) for young children use shall be applied to the handle bar fork clamping device, as shown in Fig. 8.

After the test, there shall be no movement of the handle bar stem relative to the fork stem.

### 6.5 Fatigue Test on Handle Bar and Stem Assembly

When tested by the method described below, there shall be no fractures or visible cracks in the handle bar stem.

NOTE — It is recommended that standardized crack inspection methods are used.

#### 6.5.1 *Assembly*

The handle bar and stem shall be in the fully-finished condition. Unless the handle bar and stem are permanently connected, for example, by welding or brazing, the grips of a flat handle bar or drop handle bar shall be aligned in a plane perpendicular to the stem axis (*see* Fig. 9). In the case of an adjustable high-rise handle bar, the handle bar shall be located so that the axis of the handgrip is horizontal (*see* Fig. 10). The handle bar stem shall be inserted to the minimum insertion depth [*see* 5(d)] and clamped by means of its usual fastening device in a fixture representative of that on a bicycle.

#### 6.5.2 *Position and Direction of Test Forces*

Dynamic test forces for handle bars other than the high-rise type shall normally be applied 50 mm from the open end of the handgrip area and parallel to the stem axis (*see* Fig. 9). For a handle bar with several possible handgrip position (for example, a drop handle bar), the forces shall be applied at locations to give a maximum bending moment for the assembly. For a high-rise handle bar, the forces shall be applied perpendicular to the head-tube axis and through a point 50 mm from the open end of the handgrip (*see* Fig. 11).

For the purposes of this particular test, a high-rise handle bar is defined as having a height, $H$, greater than 125 mm, where $H$ is the height of the point 50 mm from the open end of the handgrip above the top of the saddle with the nose and the centre of the rear edge of the saddle horizontally aligned, and the saddle pillar and the handle bar stem at their extended positions (*see* Fig. 11).

#### 6.5.3 *Magnitudes of Test Forces, Number of Test Cycles and Test Speed*

The test forces are listed in Table 2.

For handle bars other than the high-rise type, a two-stage test shall be carried out on the same assembly. In the first stage, a repeated, dynamic force of $F_1$ shall be applied to each handgrip or hand position in phase for 50 000 cycles, and in the second stage, a repeated, dynamic force of $F_2$ shall be applied to each handgrip or hand position, out of phase, for 50 000 cycles (*see* Fig. 12).

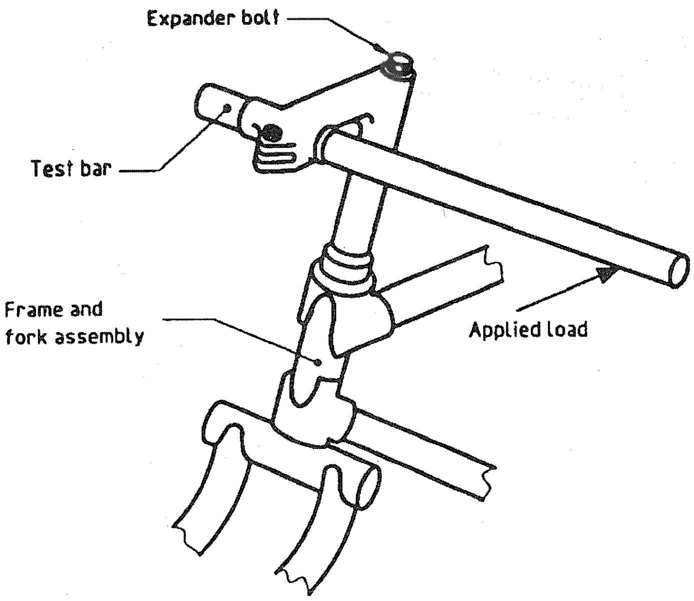
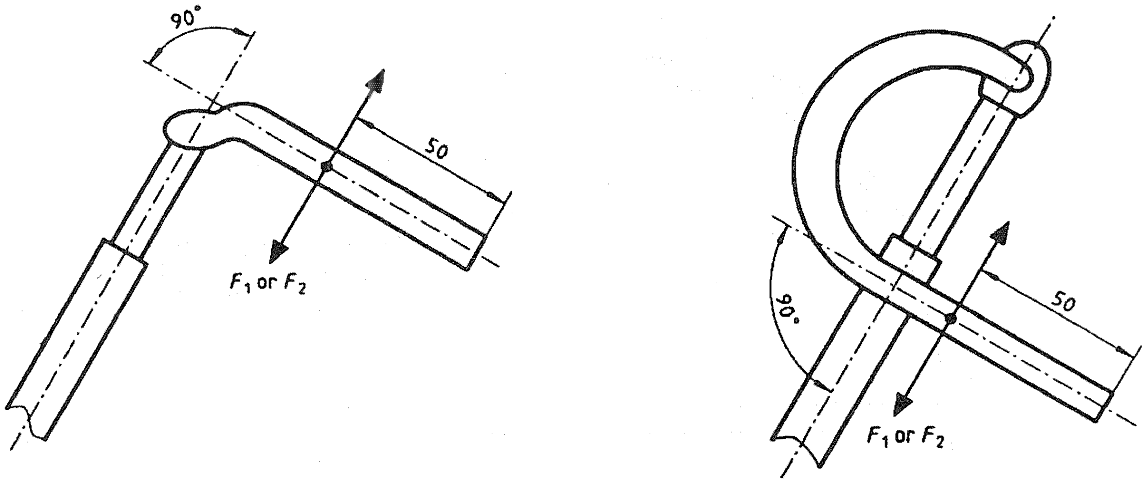


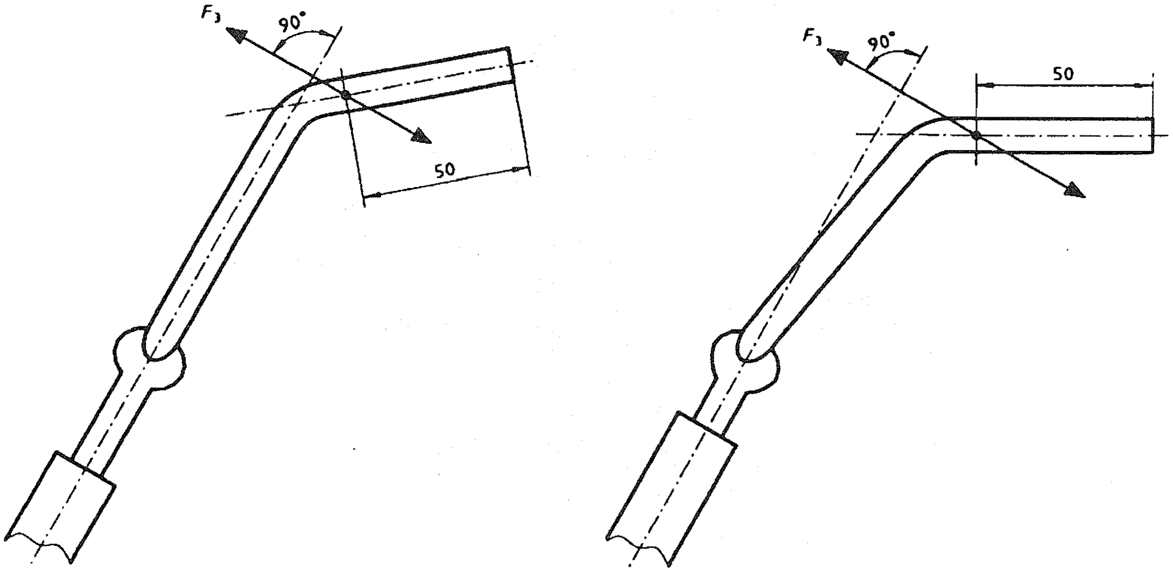
FIG. 8 TORQUE TEST ON HANDLE BAR/FORK CLAMPING DEVICE



9A Flat Handle Bar

9B Drop Handle Bar

FIG. 9 ORIENTATION OF ADJUSTABLE HANDLE BARS AND POSITIONS OF APPLIED FORCES



10A Fixed

10B Adjustable-Grip Horizontal

FIG. 10 HIGH-RISE HANDLE BARS; ORIENTATION OF ADJUSTABLE HANDLE BAR, AND POSITIONS AND DIRECTIONS OF APPLIED FORCES

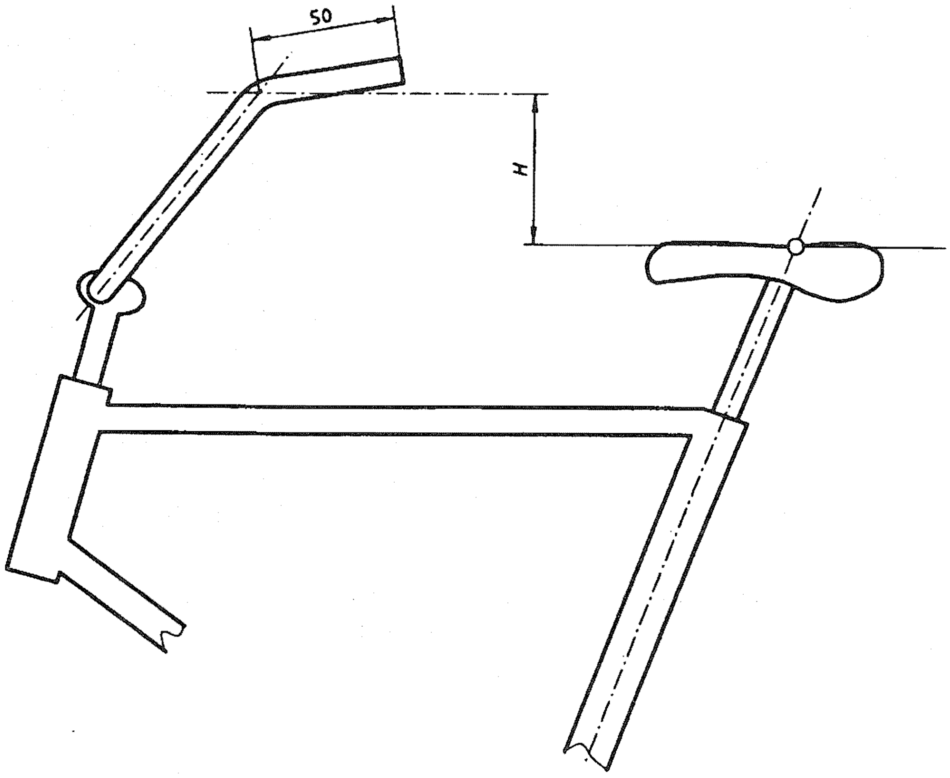
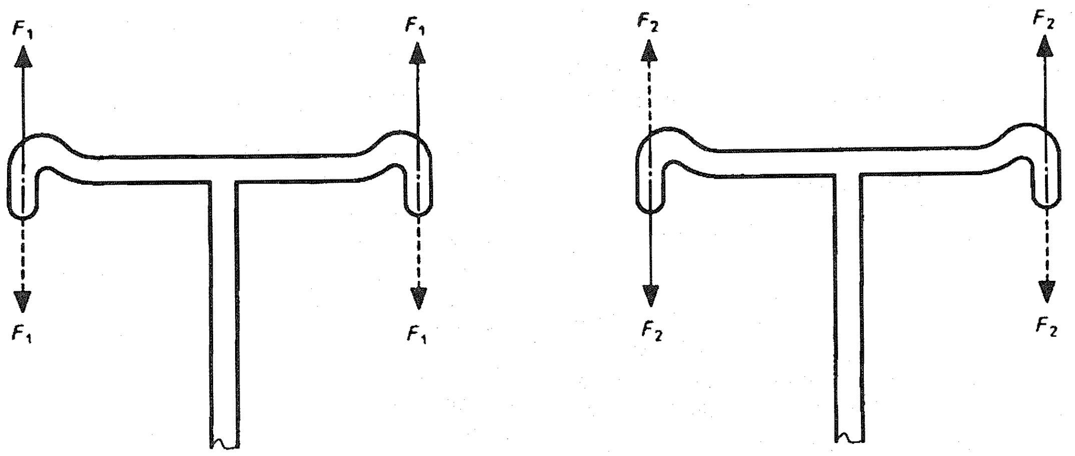


FIG. 11 HIGH-RISE HANDLE BAR; DIMENSION *H*



12A In-Phase Loading

12B Out of Phase Loading

FIG. 12 IN-PHASE AND OUT OF PHASE LOADING

**Table 2 Test Forces on Handle Bars**

(*Clause* 6.5.3)

| **Materials** | **Test Forces (N)** | | | | |
|---|---|---|---|---|---|
| | Type of Handle Bar | | | | |
| | Drop | | Flat and upright | | High-rise |
| | In-phase force, $F_1$ | Out of phase force, $F_2$ | In-phase force, $F_1$ | Out of phase force, $F_2$ | In-phase force, $F_3$ |
| Ferrous[1] | ± 350 | ± 145 | ± 250 | ± 145 | ± 150 |
| Non ferrous[2] | ± 450 | ± 200 | ± 350 | ± 200 | ± 210 |

---

[1] Component composed of structural members made entirely from ferrous materials excluding any jointing media such as brazing materials or adhesives.

[2] Component composed of structural members made entirely from non-ferrous materials excluding any jointing media such as adhesives.

For a high-rise handle bar, a single-stage test shall be carried out with a repeated, dynamic force of $F_3$ applied in-phase for 50 000 cycles.

The maximum test frequency shall be 25 Hz.

**6.5.4** *Accuracy of Test Forces*

Applied forces shall be accurate to within ± percent of their nominal values, as determined by suitable means of calibration traceable to National or International Standards.

NOTE — Guidance on calibration can be found in IS/ISO 9001.

**6.5.5** *Fatigue Test on Stem Alone*

When the fatigue test is for the stem only, the manufacturer shall specify the types and sizes of handle bar for which the stem is intended, and the test shall be based on the most severe combination.

**6.6** For the brake lever combined handle bars, lever springs shall be such that when the lever is pressed fully and released 50 times, it shall return to its normal position.

## 7 FINISH

The handle bars and stems shall be nickel plus chrome plated and the electro plated coatings shall conform to Service Condition No. 1 with Classification Code Fe/Ni 10b Cr r of IS 1068 with provision that s Nickel may be substituted for b nickel, and mc or mp chromium may be substituted for r-chromium.

For powder coated handle bars and stems — Bright/ Mat finish with thickness of 50 micron minimum shall be applied.

## 8 MARKING

**8.1** The handle bars and stems shall be marked indicating the source of manufacture, or trade-mark and country of origin.

### 8.2 BIS Certification Marking

The handle bars may also be marked with the Standard Mark.

**8.2.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 9 CRITERIA FOR CONFORMITY

Unless otherwise agreed to between the manufacturer and the purchaser the procedure given in IS 2500 (Part 1) shall be followed. The single sampling plan to be followed for each characteristic shall be corresponding to the inspection level and AQL as given below:

| *Characteristic* | *Inspection Level* | *AQL* |
|---|---|---|
| Dimensions, finish and manufacture | S-3 | 2.5 |
| Tests | S-1 | 1.0 |

# ANNEX A

*(Foreword)*

## COMMITTEE COMPOSITION

Bicycles Sectional Committee, TED 16

| *Organization* | *Representative(s)* |
|---|---|
| Hero Cycles Ltd, Ludhiana | Shri S. K. Rai (***Chairman***)<br>Shri Brijmohan Lal (*Alternate*) |
| Atlas Cycles (Haryana) Limited, Sonepat | Shri Vikram Kapur<br>Shri Ashok Kumar (*Alternate*) |
| Avery Cycle Industries Ltd (Avon Group), Ludhiana | Shri Harcharan Singh<br>Shri Ashwani Kumar Bhakhan (*Alternate*) |
| Avon Cycles Ltd, Ludhiana | Shri Onkar Singh Pahwa<br>Shri Rishi Pahwa (*Alternate*) |
| Bhogal Sons (Regd), Ludhiana | Shri Harinder P. Bhogal<br>Shri Naginder Singh Bhogal (*Alternate*) |
| Bicycle & Sewing Machines (R&D Centre), Ludhiana | General Manager<br>Shri Shamsher Singh (*Alternate*) |
| Controllerate of Quality Assurance (Vehicles), Ahmednagar | Joint Controller<br>Deputy Controller (*Alternate*) |
| Department of Industrial Policy & Promotion, New Delhi | Shri M. M. Ali Khan<br>Shri B. C. Nayak (*Alternate*) |
| Dewan Rubber Industries Ltd, Meerut | Shri Vivek Dewan<br>Shri C. K. Saxena (*Alternate*) |
| Director of Industries, Ludhiana, Punjab | General Manager<br>Senior Technical Officer (*Alternate*) |
| Directorate General of Supplies and Disposals, New Delhi | Shri S. M. Munjal<br>Shri W. M. Wanjari (*Alternate*) |
| Directorate of Industries, Government of Haryana, Chandigarh | Shri R. N. Goyal<br>Shri Sunil Chopra (*Alternate*) |
| Eastman Industries, Ludhiana | Shri Jagdeep Singh |
| Govind Rubber Ltd, District Ludhiana | Shri Vinod Poddar<br>Shri S. P. Sukhrani (*Alternate*) |
| Hamilton Industries Pvt Ltd, Ambarnath | Shri M. R. Prajapati<br>Shri P. R. Ravikumar (*Alternate*) |
| Hartex Rubber Ltd, Hyderabad | Shri K. Subramanian<br>Shri Ravindra Pant (*Alternate*) |
| J. K. Cycles, Ludhiana | Shri Joginder Kumar |
| Kular Cycle Industries, Ludhiana | Shri Ajit Singh<br>Shri Darshan Singh (*Alternate*) |
| Metro Tyres Limited, Ludhiana | Shri L. K. Mathur<br>Shri Sanjeev Sood (*Alternate*) |
| Nova Bicycle Industries, Ludhiana | Shri Harminder Singh Pahwa<br>Shri Rohit Pahwa (*Alternate*) |
| Office of the Development Commissioner (SSI), New Delhi | Shri R. L. Garg<br>Shri M. B. Jaya Kumar (*Alternate*) |
| Ralson (India) Limited, Ludhiana | Shri Sanjeev Pahwa<br>Shri T. R. Kukreja (*Alternate*) |
| Sadem Industries, Ludhiana | Shri Satish Kumar Dhanda |
| Seth Industrial Corporation, Ludhiana | Shri B. K. Seth |

| *Organization* | *Representative(s)* |
|---|---|
| T. I. Cycles of India, Chennai | Shri S. Sadish Kumar<br>Shri V. Durairaj (*Alternate*) |
| United Cycle & Parts Manufacturers Association, Ludhiana | President<br>Secretary (*Alternate*) |
| BIS Directorate General | Shri S. K. Bhatia, Director and Head (TED)<br>[Representing Director General (*Ex-officio Member*)] |

*Member Secretary*
Shri J. M. Khanna
Joint Director (TED), BIS